

MIZORAM PUBLIC SERVICE COMMISSION

DEPARTMENTAL EXAMINATIONS FOR JUNIOR GRADE OF M.E.S. (AE/SDO) UNDER PUBLIC WORKS DEPARTMENT, SEPTEMBER, 2018.

MECHANICAL ENGINEERING PAPER – I

Time Allowed : 3 hours

FM : 100 PM : 40

Attempt only 5 (five) questions. Answers should be short and specific.

The figures in the margin indicate full marks for the questions.

1. (a) The following observations were obtained during a diesel engine trial: (3×2=6)

Cylinder diameter	= 24 cm
Stroke	= 40 cm
Speed	= 250 r.p.m
Brake load	= 70 kg
Brake drum diameter	= 2.1 m
Mean effective pressure	= 6.3 kg/cm ²

Find :

 - (i) brake horse power
 - (ii) Indicated horse power
- (b) Explain the kinds and sources of lubrication. (6)
- (c) Differentiate between two stroke and four stroke engines. (8)
2. (a) Name alternative fuels that can be relatively easily used in conventional compression ignition engines and discuss any one of them. (10)
- (b) Discuss the application of renewable energy in transport vehicles. (10)
3. (a) Give the applications of Boom hoist. (4)
- (b) Differentiate between Hydraulic Concrete Mixture with Hand Feed Concrete Mixture. (6)
- (c) Explain classification of Construction Equipments. (10)
4. (a) Describe briefly the applications of Cranes and Conveyors in construction works. (5×2=10)
- (b) Discuss the characteristics of material handling equipments. (10)
5. (a) What are different types of construction equipments? Describe specific factors behind selection of construction equipments. (3+7=10)
- (b) Describe selection criteria for concreting equipments. (10)
6. (a) What is preventive maintenance? What are its advantages? (2+4=6)
- (b) Describe briefly the salient features of a perfect repair cycle. (7)
- (c) Explain briefly the merits of inventory management principles aspects related to preventive maintenance. (7)
7. (a) Describe procedures to be followed for hiring of construction equipment. (10)
- (b) You are supposed to hire a Roller Compactor of a particular model, explain how you will calculate hiring rates. (10)